

SCOUTING HAZELNUT ORCHARDS

Benefits of scouting:

- Routine, systemic inspection of a crop for insects, diseases and weeds
- Allows for a (relatively) unbiased estimate of the **average** level of pest infestation in your crop
- To make informed, properly timed decisions about pest control **and** to assess its success
- Become familiar with what is normal for your crop

How to scout:

- Timing: Monitor at least once per week, at approximately the same time of day
- Overall scan: Start with overall scan of orchard to look for patterns such as patches of poor plant growth or off-colours. Visit these areas
- Walk a transect: Walk the orchard in a W or zig-zag pattern and visit a set number of **randomly selected** plants to assess pests and collect samples, if needed. It is natural to gravitate towards trees with symptoms. **Randomly selecting** trees allows for a better estimate of average pest numbers in the orchard, especially for sporadic insect pests like aphids, caterpillars, Japanese beetles or scale.
- Edge versus interior: Scout and record orchard edges separately from the interior. Many pests enter an orchard from surrounding areas. Pay special attention to border areas.
- How many to assess? Nothing scientifically established for hazelnuts in Ontario. Following sampling guidelines for other tree fruit in Ontario, or for hazelnuts in other regions are possible methods. For example:
 - 10 terminals on 10 trees/block or 5 terminals on 20 trees/block
 - Divide large orchards into smaller areas or block
 - Pick something you can stick with consistently on a weekly basis.
 - The more you look, the more you will find.
- Scan for symptoms: Although you are randomly selecting trees for insect counts, as you travel between them, scan for trees with unusual symptoms. Flag and make a note of any obvious pest issues, especially things like eastern filbert blight and bacterial blight, which will facilitate cultural practices like pruning.
- Return to hot spots: Revisit symptomatic trees or hot spots flagged in previous weeks to determine if damage has spread.
- Plant inspections:
 - At each tree, scan entire plant for insect feeding or signs of disease.
 - Make sure to look for cankers or lesions on branches or trees. Where leaves appear to be wilting or dead, follow the branch to below where symptoms begin and look closely for cankers.
 - Choose 5-10 terminals (the apical end or shoot tip) and closely examine 3 leaf clusters and 3 nut clusters/terminal. Record numbers of live insects on top and bottom of leaves and on or under husks. Record any feeding

- damage on leaves and feeding damage/entrance or exit holes on nuts. Also note presence/absence of disease on leaves, nuts and branches.
- Record the presence of any beneficial insects (e.g. ladybeetles, spiders, lacewing larvae, etc.).
- Foliar mites will require a high magnification hand lens (you may want to collect the leaves and examine indoors).
- Tapping: Can be useful in monitoring for caterpillars, some beetles, and beneficial insects. Hold a tapping tray beneath a branch and hit it sharply 2-3 times with a padded stick. This will dislodge insects onto the tray where they can be observed or counted.
- Traps – pheromone: Pheromone traps contain chemicals specific to particular pests, attracting adults to the trap where they can be recaptured. They can be useful in determining presence or absence of pests, or the first flight or peak activity of certain insects. This information can be used to predict when egg hatch begins, to time control measures. In hazelnuts, pheromone traps can be used to monitor for obliquebanded leafroller, filbertworm and brown marmorated stink bug. Pheromone traps are also available for codling moth and oriental fruit moth, although these are infrequent pests of hazelnuts in Ontario.
- Traps – other: Sticky substances placed adjacent to blasted buds can trap migrating mites to help time control measures. Place double-sided stick tape, tacky insect glue or Tanglefoot on branches below blasted buds and count trapped mites at regular intervals using a high magnification hand lens. Adhesive substances can also be applied around infestations of adult scales to determine when susceptible crawler stages are active.

Background information important to scouting:

Diagnosing pest problems is greatly aided by knowing the history of your orchard and surround areas. Important information includes:

- Previous crops, adjacent crops/non-crop areas (any wild hazelnut?)
- Pesticides, fertilizers, etc. used on or near the crop and how they were applied
- Planting conditions and source of planting material
- Current soil or leaf tests
- Soil moisture, compaction, tillage, drainage, irrigation amounts and timing
- Environmental events - air pollution, hail, excessive rain, cold winter, spring frost
- Common pests and their biology

Management – what to do with scouting information:

- **Economic Injury Level** – the pest numbers at which the cost of management is equal to the value of the loss caused by pest damage
- Thresholds are often based on scientific studies done over several years.
- No thresholds have been established for most hazelnut pests in Ontario. For hazelnuts, thresholds are adapted from other areas or crops, or based on experience.